

I. Rejection of Claims 8, 11-13, 14-16 and 19-21 under 35 U.S.C. §103

The Examiner rejected Claims 8, 11-13, 15-16 and 19-20 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,524,959 to Lu *et al.* (Lu) in view of U.S. Patent No. 6,537,133 to Birang *et al.* (Birang). In addition, the Examiner rejected Claims 14 and 21 under 35 U.S.C. §103(a) as being unpatentable over Lu and Birang in view of U.S. Patent No. 6,028,669 to Tzeng.

Lu describes a fabrication technique for planarized microelectronic layer employing a chemical mechanical polish (CMP) planarizing method or process. The described technique is applicable to a substrate where at least one microelectronic layer is partially transparent to an incident radiation beam. A CMP planarizing endpoint is determined by causing a radiation beam to be incident upon a microelectronic layer and detecting a reflected portion of such incident beam. (Col. 3, line 15 - Col. 4, line 4). Figure 1 of Lu shows an incident radiation beam 22 issuing from a source 20, passing through several transparent layers 12-18, where each such layer 12-18 reflects a beam 24a-24e, with the remaining beam reflected by the substrate 10. The series of reflected beams 24a-24e are detected (Col. 6, line 61 - Col. 7, line 41) and the properties of such beams 24a-24e are used to detect a planarizing endpoint. (Col. 8, lines 20-41).

Lu does not describe a signal transmitted from an emitter located on one side of a semiconductor wafer, adjacent to either a carrier head or a polishing platen, with a second signal emanating from the opposite side of the wafer to be detected by a receiver located adjacent to whichever one of the carrier head or polishing platen that was not adjacent the emitter. Lu teaches the use of a reflected signal that is detected by a detector located on the same side of the wafer as the device originating the incident radiation beam. Lu does not teach or suggest determining an endpoint by detecting a signal on the opposite side of the wafer.

Birang does not overcome the Lu shortcomings. Birang also describes employing a device for determining an endpoint during the CMP process. Birang uses a laser interferometer for generating a laser beam directed towards the wafer and a detector, located on the same side of the wafer as the laser beam generator, for detecting light reflected from the wafer. (Abstract). Birang does not teach or suggest that an endpoint can be detected by generating a signal on one side of a wafer and detecting a second signal on the other side. Lu, individually or in combination with Birang, thus fails to teach or suggest the invention recited in independent Claims 8 and 15.

With respect to Claims 14 and 21 rejected by the Examiner under 35 U.S.C. §103(a) as unpatentable over Lu and Birang in view of Tzeng, Tzeng also does not overcome the shortcomings of either Lu or Birang. Tzeng describes the use of an optical monitor where a reflected optical signal is detected and processed to provide information regarding the progress of material formation or removal and an indication of when an end point has been reached. (Abstract). Again, as was the case with Lu and Birang, this determination is made from a reflected signal, where both the source of such signal as well as the detector of such signal are on the same side of the wafer. Thus, neither Lu and Birang in view of Tzeng teaches or suggests the invention recited in Claims 14 and 21 which depend on Claims 8 and 15.

Therefore, independent Claims 8 and 15 and their respective dependent claims, when considered as a whole, are not obvious and the cited references do not support the Examiner's rejection of Claims 8, 11-13, 14-16 and 19-21 under 35 U.S.C. §103(a). The Applicants respectfully request the Examiner to withdraw the rejection.